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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

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**SUB-
JECT:** Draft Human Health Risk Assessment, SWMU 15
Biopile, Oceana Naval Air Station

FROM: Betty Ann Quinn, Toxicologist
Technical Support Branch (3WC11)

TO: Robert Thomson, Project Manager
Federal Facilities Branch (3HS50)

I have reviewed the human health risk assessment of the SWMU 15 biopile soil. I recommend approval of this document, provided the changes listed at the end of this memo are incorporated into the final document.

As requested, Oceana performed a human health risk assessment of biopile soil. Two exposure routes, residential and recreational, were evaluated for both adult and child exposure. Exposure factors that were agreed to in January, 1999, were used to calculate risks. As expected, the highest risks were associated with polynuclear aromatic hydrocarbons (PAH) compounds. None of the calculated hazard quotients for noncancer exposure exceeded the acceptable threshold of 1. Excess cancer risks associated with PAH exposure ranged from a high of $2.2\text{E-}05$ for residential adult/child exposure to $1.9\text{E-}06$ for recreational adult exposure. All calculated cancer risks exceeded the lower acceptable threshold of $1\text{E-}06$, but all were within the target risk range of $1\text{E-}06$ to $1\text{E-}04$. However, it should be noted that no quantitative evaluation of risks associated with dermal exposure to carcinogenic PAHs is presently possible, due to a lack of toxicity data. Also, quantitation of risks associated with inhalation exposure to carcinogenic PAHs is possible only for benzo(a)pyrene (BAP). Therefore, total risks for PAHs may be higher than the values presented in the report. As noted below, this fact should be clearly noted in the uncertainty section of the risk assessment.

The following modifications should be made prior to finalization of the report.

1. Section 2.3, Selection of Chemicals of Potential Concern: Lack of toxicity criteria is not one of the elements listed in the section which would be used to eliminate contaminants from inclusion in the risk assessment, yet it appears that two constituents were eliminated for this reason. Of greater concern is the elimination of 4-isopropyltoluene, which was measured in approximately one-half of soil samples, with no supporting rationale. The presence of 4-isopropyltoluene in biopile soil should be acknowledged, and while quantitative evaluation may not be possible, qualitative information regarding its toxicity should be discussed.
2. Section 6.2, Uncertainty Associated with Exposure Assessment: It should be acknowledged in

this section that dermal exposure to carcinogenic PAHs is not quantitatively evaluated in the risk assessment, and that inhalation exposure to carcinogenic PAHs is evaluated only for BAP. With regard to these uncertainties, risks for PAHs are underestimated. This fact should also be noted.

3. Section 6.3, Uncertainty Associated with Toxicity Assessment: It should also be noted in this section that isopropyltoluene is not quantitatively evaluated due to a lack of toxicity criteria. Lack of toxicity criteria does not mean that no risk is associated with a contaminant; rather, that risk cannot be quantified.

4. Section 6.5, Overall Uncertainty in the Risk Assessment: The first statement in this section should be revised to explain that the risks presented in the report are intended to be representative of the upper bound case, and are calculated using exposure factors that represent the average and high end of the exposure range. It cannot be stated that estimated risks are likely an over estimate, especially when no quantification of risks associated with dermal exposure to PAHs or associated with inhalation exposure to the majority of carcinogenic PAHs is possible. The likely underestimation of risks associated with PAH exposure should also be noted in this summary section.